

REMARKS

Claims 1-14 and 21-24 are pending in the application. Claims 15-20 are cancelled. Claims 1, 7, and 23 have been amended. Claim 7 has been rewritten in independent form, to include the limitations of base claims 1 and 3. Claims 1 and 23 have been amended to clarify the invention. No new matter has been added.

Applicants thank the examiner for his indication of allowable subject matter in claims 1-14. In accordance with the rewritten form of claims 7 and 8, i.e., the rewriting of dependant claim 7 to independent form including the limitations of claims 1 and 3, applicants submit that claims 7 and 8 are now in allowable form. Furthermore, applicants believe that claims 9-14 are allowable in their present form, due to their dependencies from claim 1. The allowablity of claim 1 is discussed further below.

Claim Rejections Under 35 U.S.C. §103

Claims 1-3, 5, 21 and 23-24 were rejected under 35 USC 103(a) as being unpatentable over Lee, et al. (US 6,486,059) in view of Subramian et al., (US 6,465,889) and in view of Sundararajan et al. (US Patent Application Publication 2002/0027286). Applicants believe that the clarifying amendments made to claims 1 and 23 overcome the rejections.

Lee discloses an etching stop layer 38 formed on a first low-k ILD layer 361 (3: 44-61). An antireflective coating (ARC) 40 is shown formed on the etching stop layer 38, purportedly for providing better lithography in patterning the via hole 46. Because the two layers in Lee comprise an etch stop layer formed between a first ILD and the second ILD, they do not teach or suggest all elements of claims 1 and 23. More specifically, these two layers in combination cannot be reasonably construed as teaching or suggesting the first barrier layer and the second barrier layer deposited directly on the top of the first barrier layer, as required by claims 1 and 23, since the layers in Lee are not formed directly on the interconnect layer or the layer having an interconnect conductor. This distinction is significant in that the layers in Lee provide etch stop functions but would not prevent diffusion of the interconnect metal conductor(such as , for example, metal wire 32) into the dielectric and/or later

formed resist layers.

Subramanian generally teaches a single layer of SiC serving the combined capping and BARC layer functions, instead of older technology using SiN for a capping function. Thus, Subramanian, either alone or in combination with the other art of record, fails to teach or suggest the elements of claims 1 and 23, at least due to the absence of the first barrier layer in combination with the second barrier layer formed directly on top of the first barrier layer.

Like Subramanian, Sundararajan fails to teach or suggest a dual layer barrier film as required by claims 1 and 23. Instead, teaches the formation of a single SiCN layer as a barrier layer. The single layers taught by Sundararajan would fail to offer the advantages of the dual layer barrier recited in the claims, for example in protecting the dielectric from the diffusion of nitrogen, as described in the detailed description of the application for one embodiment of the invention.

In view of the foregoing discussion, the rejection of claim 1 and 23 over the art of record is believed overcome. Applicants gratefully acknowledge the indication that claims 7-14 contain allowable subject matter and would be allowable if rewritten in independent form. Claim 7 has been rewritten in independent form and claim 8 depends from claim 7. However, in view of the foregoing discussion, the other claims in this group are believed to be allowable in their present condition without amendment.

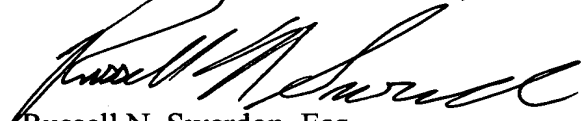
Claims 2-6 and 9-14 and 21-22 depend from claim 1 and are submitted to be allowable for at least their dependencies from an allowable claim. Moreover, the dependent claims recite additional limitations, and are therefore allowable for these reasons as well. Further discussion of these distinctions is believed unnecessary in light of the distinctions discussed above relative to the independent claims.

Claim 24 likewise depends from an allowable base claim (i.e., claim 23) and submitted to be allowable for at least its dependency from an allowable claim. Applicants respectfully request that the Examiner provide a notice of allowance for the pending claims.

Conclusion

In view of the foregoing, Applicants believe that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below. No fees are believed due in connection with the filing of this paper. If any fees are due over and above the fees provided with the amendment, such fees may be charged to deposit account No. 12-2252 (client docket 01-206).

Respectfully submitted,
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